

CLAIMS:

1. An optical head for scanning a first optical record carrier including a first information layer and a first transparent layer having a first thickness and for scanning a second optical record carrier including a second information layer and a second transparent layer having a second thickness different from the first thickness,

5 the head including a radiation source for generating a first radiation beam having a first wavelength and a second radiation beam having a second wavelength different from the first wavelength, the second radiation beam including a central sub-beam and an outer sub-beam,

10 an optical system for converging the first radiation beam through the first transparent layer to a focus on the first information layer and for converging the second radiation beam through the second transparent layer to a focus on the second information layer,

15 and a detection system for receiving radiation of the first and second radiation beam from the information layer and including a photo-sensitive area arranged in a detection plane,

20 the optical system including an optical element having a non-periodic phase structure, the phase structure including a plurality of concentric areas inducing a wavefront deviation in the first radiation beam that globally approximates a flat wavefront deviation and inducing a wavefront deviation in the central sub-beam that compensates the difference in spherical aberration due to the first and second transparent layer,

characterised in that the optical element is transparent for the first radiation beam, the central sub-beam and the outer sub-beam, and

25 that the wavefront deviation induced in the second radiation beam is such that, when the focus of the central sub-beam is located on the second information layer, the radiation of the central sub-beam and the outer sub-beam form a central intensity distribution and an outer intensity distribution, respectively, in the detection plane, the central intensity distribution and the outer intensity distribution being separated by a substantially dark area, and

the photo-sensitive area captures radiation of substantially only the central distribution.

2. The optical head according to Claim 1, wherein the photo-sensitive area has an
5 edge arranged in the dark area of the intensity distribution.

3. The optical head according to Claim 1, wherein the phase structure induces a
wavefront deviation in the second radiation beam that globally approximates spherical
aberration and defocus, the defocus changing the axial distance between the focus of the
10 central sub-beam and the focus of the outer sub-beam.

4. The optical head according to Claim 1, wherein the phase structure introduces
the defocus in the central sub-beam.

15 5. The optical head according to Claim 1, wherein the phase structure introduces
the defocus in the outer sub-beam.

6. The optical head according to Claim 1, wherein the axial distance between the
focus of the central sub-beam and the focus of the outer sub-beam is at least 12.5 µm.

20 7. A device for scanning two types of optical record carrier, the device including
an optical head according to Claim 1 and an information processing unit for error correction.